

ABSTRACT OF THE DISCLOSURE

A vascular or endoluminal stent adapted for deployment in a vessel or tract of a patient to maintain an open lumen therein is formed from a metal open-ended tube which is the single component of the stent. The tube has a multiplicity of holes cut by laser through its wall. The through-holes are encompassed by serpentines that constitute the wall, the serpentines extending sinusoidally each in multiple 360° wavelengths in a single turn about the axis of the tube and juxtaposed in plural substantially identical segments disposed with regularity along the axis. Each segment has a length equal to the distance between crests and troughs of the sinusoid. Adjacent serpentines are joined together at crest and trough, respectively, so that their interconnections are 180° out of phase relative to their wavelength. The serpentines and interconnections thereof are shaped throughout for optimum uniform expansion of the stent during deployment thereof, including a notch substantially symmetrically located at either side of the junction of the respective crest and trough of the interconnections between adjacent serpentines. The serpentines are substantially devoid of sharp corners and edges, except at the notches, and each serpentine has an oval cross-section. The regularity of the segments is interrupted at least once along the axis of the tube by serpentines oriented differently from the others, used to maintain the tube's length substantially invariant despite radial expansion of the stent during deployment. The serpentines are pre-stressed and annealed before deployment of the stent to ease deployment and enhance symmetrical radial expansion. The exterior surface of the tube is longitudinally tapered from its mid-point toward its ends, and substantially rounded surfaces prevail throughout the tube.



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A vascular or endoluminal stent is adapted for deployment in a vessel or tract of a patient to maintain an open lumen. The stent constitutes a scaffold formed from a single open-ended tube having a multiplicity of through-holes in its wall. The through-holes are defined by a plurality of struts that bound the holes. Each of the struts has an optimized cross-section of oval shape with a long diameter generally aligned with the length or circumference of the tube wall and a short diameter generally aligned with the thickness of the tube wall. The oval shape of the struts provide several advantages including enhancing flexibility of the stent, easing advancement of the stent through a lumen of the vessel or tract for deployment at a target site therein, protecting the balloon of a balloon catheter on which the stent is tightly crimped, and enhancing expansion of the stent during deployment while maintaining its capability to withstand compression in response to recoil of the vessel or tract following deployment.

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